TECHNICAL CONDITION ASSESSMENT

for

North Dakota Veterans Home
Lisbon, North Dakota

December 2006

Prepared by:

YHR PARTNERS
ARCHITECTURE PLANNING
420 MAIN AVENUE, BOX 818 • MOORHEAD, MINNESOTA 56560
FAX: 218-233-7988 PH: 218-233-4422

TABLE OF CONTENTS

INTRODUCTION

The following Technical Condition Assessment is a description and evaluation of the building systems at the North Dakota Veterans Home. The purpose of the survey is to evaluate the technical conditions of the buildings, to aid in prioritizing maintenance needs, determining appropriate allocation of resources for building improvements, and understanding issues which could be addressed concurrent with any expansion or remodeling campaign.

The building evaluation is documented in the following categories:

SITE: Parking Areas, Walks, Lawns, Plantings, Misc. Structures, Utilities/Lighting, Signage, Drainage, Fire Department Access.

STRUCTURE: Foundations, Bearing Walls, Skeleton, Floor Structures, Roof Structures.

ENVELOPE: Roofs, Walls (Skin), Windows, Exterior Doors, Soffits.

INTERIOR: Ceilings, Flooring, Wall Finishes, Interior Openings, Stairs/Ramps, Elevators/Lifts, Specialties, Food Service, Toilet & Bath Accessories, Miscellaneous.

CODES: Compliance with Life Safety/Building Codes - Means of Egress, Smoke/Fire Detection & Alarm Systems, Fire Suppression, Area/Occupancy Separations, Lighting Systems, Construction Type.
Handicap Accessibility- Parking/Drop Off, Site Routes, Entrances and Exits, Building Routes, Rooms/Spaces, Toilet Rooms, Signage/Signals.

MECHANICAL: Plumbing System, Plumbing Fixtures, Central Sources, Distribution System, Air Handlers, Air Distribution & Returns, Radiation/Convectors, Temperature Control Systems. (Sprinklers are under Codes)

ELECTRICAL: Main Service, Distribution/Panelboards, Power Distribution System/Outlets, Illumination, Communication/Data Systems, Electric Heating, Mechanical Equipment Connections, Other Systems (Clocks, Security, etc.), Generators.

The number evaluation rating for each entry is based on the rating scales following this summary. The Physical Ratings Scale is used in all categories except for Codes where the Code Compliance Scale is utilized. By glancing through the ratings, chronic deficiencies can be quickly noted. The illustrations and brief descriptions provide further insight into each deficiency.

The conditions were evaluated by visual inspection and consultation with Bob Nelson, Maintenance/Security Officer. Evaluation was conducted by James Simpson, AIA, CSI, CCS of this firm, Dave Obermiller, mechanical engineer of Obermiller Nelson Engineering, and Brian Poykko, electrical engineer of Obermiller Nelson Engineering.

RATING SCALES

PHYSICAL SERVICEABILITY SCALE

9 - 10	New or Performing like new in all aspects.
7 - 8	All major elements performing as intended, minor defects in some areas.
5 - 6	Most major elements performing well even though aged/worn, a few major defects or numerous minor defects.
3 - 4	Some major elements performing well even though aged/worn, some major defects and numerous minor defects.
1 - 2	A few major elements performing well but many in failure, many minor defects.
0	All aspects/elements in failure mode.

CODE COMPLIANCE SCALE

9 - 10	Appears to be in Full Compliance.
7 - 8	In General Compliance with minor elements in violation.
5 - 6	Generally Compliant, but a few large exceptions.
3 - 4	Generally Compliant with numerous large exceptions to Compliance.
1 - 2	Mostly Non-Compliant.
0	Totally Non-Compliant.

EXECUTIVE SUMMARY

The North Dakota Veterans Home is located at 1400 Rose Street in Lisbon, North Dakota. The 92-acre site is on the south side of Lisbon, just east of the Sheyenne River, and it has numerous large trees and is surrounded by gently rolling hills.

Established in 1891 and originally called the North Dakota Soldiers Home, the first barracks facility was constructed in 1893. In 1899 a hospital was built. The hospital was closed in the late 1940's and it became the Civilian Employee Quarters. The original barracks building was demolished in 1952. The main portion of the present structure was built in 1949-1950. It is a four-story building, with brick veneer. A four-story addition was built onto the east end of the building in 1980. In 1981 a new central heating plant was constructed on the site, along with an addition to the existing boiler room. The name of the facility was changed to the North Dakota Veterans Home in 1983. In 1990 another addition was constructed. It consisted of a two-story infill between the Resident Dining Room and the 1980 addition, and a two-story addition to the east end of the 1980 episode. A single-story Gazebo with a wrap-around deck was added to the east end of the 1990 episode. The original portion and the 1980 addition were re-roofed in the mid-1990's, and the Gazebo was re-roofed in 2006. In addition there have been numerous smaller re-modeling, repair and maintenance projects.

The site has a small park to the SW of the building, along with several picnic areas and pieces of war memorabilia. There is visitor parking immediately in front of the main entrance, with staff parking to the south, and on the north side of the building, and resident parking to the east.

For the purposes of this report, the main entrance of the building faces west.

View of building from NW.

View of building from west.

View of 1990 episode from SW.

View of Gazebo from SE.

CODES SUMMARY

While the actual serviceability of various elements of the buildings is important in assessing overall condition, the arrangement of the parts of the building and their relationship to various codes which can affect the use of the building is also important. Three types of regulations apply to building construction, layout and use. They are the International Building Code, the Life-Safety Code (NFPA 101), and the Americans with Disabilities Act. In addition, requirements of the North Dakota Health Dept. and the Dept. of Veterans Affairs also apply.

The International Building Code (IBC) is applicable when a building is initially constructed and again whenever the building is substantially remodeled or modified. The International Building Code has as its purpose the protection of occupants and it prescribes certain building materials and methods based upon the numbers of occupants, size of building, location on the property, use of building and number of stories. Sizes, locations, and numbers of exits are established by the IBC. The International Building Code has as companion codes, the International Mechanical Code and the National Electrical Code. These codes set standards for sanitary facilities, heating, ventilation, and lighting, among others. All of these conditions must be satisfied to obtain building and occupancy permits.

The International Building Code is a dynamic set of regulations updated every three years, and in many case has become more stringent with each new code. As a result, often what was acceptable construction practice at the time the structure was built may not be acceptable today. In addition, many states and cities have modified the IBC adding their own requirements. Owners are not required to keep their buildings current with the International Building Code except when substantial remodeling or additions to existing facilities are undertaken. The definition of 'substantial' is at the discretion of the local code official.

The second regulation is the Life-Safety Code (NFPA 101) which is generally enforced by local fire departments. The Life Safety Code can be enforced on any existing facility to ensure the on-going safety of the occupants. Periodic review of facilities by State Fire Marshals administers these requirements. The compliance requirements placed on owners varies considerably from jurisdiction to jurisdiction.

The intent of both the International Building Code and Life-Safety Code is the protection of life and property.

The Americans with Disabilities Act (ADA) is federal legislation that provides for equal access to buildings and accommodations for those with disabilities. While ADA compliance is dictated as a matter of law, and exempts some facilities, the ADA requirements are now incorporated into the International Building Code without exemptions.

PRIORITY CORRECTIVE ACTIONS SUMMARY

The following chart is a compilation of top priority deficiencies as described in the Condition Assessment Report. The deficiencies have been ranked according to physical serviceability and code compliance scales which are outlined on the previous pages. These rankings are based on our professional judgment with maintaining the integrity of the buildings and protection of life being the primary criteria. They are subject to interpretation and change based on other criteria, but establish a point of departure for developing a strategy for implementing corrective actions.

The estimated cost of the corrective actions for deficiencies assumes that the each action is handled on a individual basis, unless otherwise stated. Efficiencies may be gained by combining corrective actions into a more comprehensive project.

RATING	ELEMENT	DEFICIENCY	POSSIBLE CORRECTION	COST
1	Toilet Rms.	Not accessible	Revise as required; note 2	$ 235,000
2	Separations	Non-compliant	Revise as required; note 3	$ 235,000
2	Central sources	Exceeded expected life span	Replace boilers; modify per report; notes 4, 11	$ 310,000
2	Dist. Syst.	Inefficient	Replace piping/insul. & valves	$ 370,000
2	AHU's 5, 6, & 7	Deteriorated	Replace air handlers; modify controls; notes 5, 11	$ 575,000
3	Roofs	Deteriorated built-up roofs	Re-roof original & 1980	$ 115,000
3	Windows	Poor thermal efficiency	Replace windows	$ 185,000
3	Rooms	Not accessible	Revise as required	Note 6
3	Signage	Non-compliant	Replace signs, add strobes	$ 34,000
3	Plumbing	Piping/valves	Replace piping, install valves	$ 300,000
3	Air Dist.	Non-compliant	Revise/install ductwork & dampers	Note 7
4	Ext. Doors	Poor thermal efficiency	Replace doors	$ 27,500
4	Ceilings	Deteriorating	Replace ceilings	$ 158,000
4	Elevators	Old equipment	Replace elec. traction elevators	$ 260,000
4	Cabinets	Deteriorating	Replace cabinets	$ 229,500
4	Means of Egress	Non-compliant	Revise as required; note 8	$ 60,250
4	Bldg. Routes	Not accessible	Revise as required	Note 9
4	Plumb'g fixtures	Excess water usage	Replace fixtures & faucets in original portion	Note 10
4	Temp. Control	Limited coverage; old system	Replace system; add thermostats	$ 115,000
4	Nurse Call	Old system	Replace system	$ 82,500
	Health Dept.	Toilet at Hydrotherapy	Add toilet	$ 15,000
			Total	$3,306,750

NOTES:
1. This Summary does not include corrective actions to accessory buildings.
2. Modifying toilet rooms may reduce the number of resident beds/rooms.
3. Dampers in ductwork are included under AHU's.
4. Cost includes replacing all boilers.
5. Includes modifications to ductwork, dampers etc.
6. Cost included under Separations and Cabinets.
7. Cost included under AHU's.
8. Includes egress control devices and modifications to center stair and Lobby.
9. Cost will vary significantly depending on how problems are solved. Estimate $100,000 minimum expense.
10. Cost included under Toilet Rooms.
11. Building may have to be un-occupied during HVAC modifications.

CONDITION ASSESSMENT REPORT

Crack in asphalt paving. Note ravelling.

Spalling concrete paving. Note pop-outs.

Parking striping fading away.

Damaged concrete curb.

Finish on ramp at Gazebo deteriorating.

SITE

Parking Areas **Rating: 5**

There are four main parking areas around the building: Visitor parking at the main entrance; employee parking areas on the east and southwest sides; and resident parking to the south. The resident parking lot is paved with concrete while the others have asphalt. The resident lot and the employee lot to the SW have concrete curb and gutter. Asphalt-paved areas were re-sealed in 2003.

The asphalt is ravelling in some areas (losing pavement from the top down), as well as showing slight signs of frost heave and both slight longitudinal and transverse cracking probably caused by substrate settlement and movement.

The resident parking lot is paved with concrete. The surface has many pop-outs, and is both scaling and spalling in numerous places. There are also numerous cracks, ranging from hairline to significant.

Concrete curbs exhibit some minor damage, most likely caused by snow removal equipment.

In all the parking areas the striping is either worn off or fading away.

Roads around the site are paved with asphalt. There are numerous cracks and places where the surface is ravelling.

Walks, Etc. **Rating: 8**

Walks are paved with concrete, and except for minor cracking and pop-outs are in satisfactory condition.

The finish on the plywood ramp from the Gazebo deck is deteriorating. Staff indicated that the Health Dept. required the area beneath the ramp to be completely filled so that sprinklers would not have to be installed. Because of this there is little ventilation, allowing moisture to build up.

Lawns **Rating: 7**

Lawn areas were dormant at the time of the assessment. They appear to be generally healthy, however there are some bare spots. A portion of the site has an automatic sprinkler system

Plantings **Rating: 7**

Trees and shrubs were dormant at the time of the assessment, however they appear to be generally healthy.

Misc. Structures **Rating: 6**

There are several accessory buildings on the site, including the boiler plant, the original boiler plant, a 3-stall garage and a metal storage building. These buildings are discussed at the end of this report. The Commandant's Residence is in a separate report.

There is a granite monument just south of the visitor parking area. Except for minor rust stains on the base it is in satisfactory condition. The rust is most likely due to minerals in the local water supply being deposited on the granite by the irrigation system, then rusting when rained on.

Rust on metal railing.

There is a chain link fence on the north side of the building. A hole has been cut for drainage adjacent to the staff parking lot. In addition there are other minor defects in the fabric and the posts.

There is a metal railing at the main entrance. The paint is deteriorating and the metal is rusting in many places.

There is a deck with a wooden railing around the Gazebo, with a ramp down to grade on the south side. A small piece of wood trim is missing from the cap at the bottom of the ramp. The painted finish on the ramp has virtually worn away exposing the plywood.

Lichens growing on brick sign base.

Utilities/Lighting **Rating: 8**

No problems were observed or reported with any site utilities.

Signage **Rating: 6**

There is a lighted monument/planter sign at the entrance to the site. The sign itself is in satisfactory condition, however the joints in the brick base are deteriorating due to water in the planter, and lichens are growing on the brick on the north side.

Deteriorating mortar joints.

There is another monument/planter sign just east of the main entrance. The metal letters are in satisfactory condition, but the mortar joints in the brick base are deteriorating due to water in the planter.

There is a wooden address sign adjacent to the entrance to the residents parking lot. Other than slightly deteriorating finish, the sign appears to be in satisfactory condition.

Erosion at staff parking lot.

Erosion under sidewalk at north end of building.

Exposed PVC storm drainage piping near Gazebo.

Settlement adjacent to west side of laundry allows ponding.

Limited access to fire department siamese connection.

Drainage **Rating: 5**

Site drainage on the surface, and runs generally to the north and east. There are numerous swales and other surface drainage elements. Holes have been provided in curbs and planter borders to allow for drainage. Exposed PVC pipe is used to drain storm water adjacent to the Gazebo. On the north end of the original portion, and on the west side of the 1980 addition, the soil adjacent to the building has settled, creating areas where water will pond adjacent to the structure. Staff reported that storm water used to infiltrate the Laundry. Additional fill has been added, and more is necessary. On the north side of the staff parking lot on the east side of the building, there is some minor erosion where the drainage passes under a chain link fence. There is also some minor erosion at the east end of the 1990 episode adjacent to where the rain water leader discharges, and also under the sidewalk at the north end of the original portion.

Additional asphalt had to be added adjacent to the north wall of the 1990 addition to provide positive drainage away from the building after the original paving had settled. See also "Structures: Floor Structures".

Emergency Vehicle Access **Rating: 7**

There is emergency vehicle access to three sides of the facility. The roadways are somewhat narrow for fire trucks, but for the most part they are looped or ample turn-around space is provided.

There is one fire hydrant near the building. It is just south of the main entrance. Another hydrant is near the Commandant's Residence.

The siamese connection for the fire department is adjacent to the main entrance, but access is limited due to adjacent steps and ramps.

STRUCTURES

Foundations **Rating: 7**

The building has reinforced concrete footings and foundations throughout. Several minor cracks in both interior and exterior walls were observed which could indicate slight settling of the structure. Nothing was observed that would indicate any serious problems with the footings or foundations.

Concrete sun shade spalling.

Crack in concrete bearing wall, SE corner of south wing, 1990 addition.

Crack in concrete masonry bearing wall, first floor, 1990 episode.

Gaps in joints between tile in Receiving Room, 1990 addition.

Bearing Walls **Rating: 7**

The original portion of the building has cast-in-place concrete bearing walls around the perimeter, and structural clay tile bearing walls on each side of the center corridor. No problems were observed. At the north and south ends of the original portion there are cast-in-place concrete beams with painted, cantilevered concrete sun shades above the windows. The paint on the sun shades is deteriorating and the concrete is spalling.

Drawings of the 1980 episode were not available for review. However, based on site observations it appears that interior and perimeter bearing walls are concrete masonry. There is a small crack adjacent to the door to the Laundry. No other problems were observed.

The first floor of the 1990 episode has cast-in-place concrete bearing walls at new perimeter walls. On the second floor the new perimeter walls are concrete masonry units. This episode also utilizes the bearing walls of the original portion. One small crack was observed at the SE corner of the south wing, 1990 episode. There are a couple of small cracks in the concrete masonry bearing walls in the corridor on the first floor.

Skeleton **Rating: N/A**

The building has no skeleton.

Floor Structures **Rating: 7**

The ground floor (lowest level) in the original portion of the building is a concrete slab on metal deck supported by steel joists. There are cracks in the vinyl tile behind the serving line in the Resident Dining Room that could indicate some minor deflection. No significant problems were observed. The ground floor in the remainder of the facility is a concrete slab-on-grade. There are significant floor tile cracks and gaps in joints adjacent to the exterior doors at the Receiving Room. Staff reported that a portion of the floor slab was cut out and replaced because it had settled. The existing cracks and gaps have occurred since that replacement. Minor cracks in the vinyl tile adjacent to the elevator in the 1980 episode could be indicative of slab settlement.

The upper floors in the original portion of the building, and the in the 1990 episode are concrete slab on metal deck, supported by steel joists. In the 1990 addition, steel beams and columns support the joists at interior walls, and where the existing walls could not be used to support the structure. Nothing was observed that would indicate any problems with the floor structure in these areas.


Badly bent metal flashing.


Aggregate surfacing shifting.


Crack in surface of roof repair.


Built-up roof on sun shade.


Typical scupper.

No drawings of the 1980 episode were available for review, but nothing was observed that would indicate any problems with the upper floor structures.

Roof Structures **Rating: 8**

The roof on the original portion of the building, and the on the 1990 episode is a concrete slab on metal deck, supported by steel joists. Nothing was observed that would indicate any problems with the roof structure in these areas.

No drawings of the 1980 episode were available for review, but nothing was observed that would indicate any problems with the roof structure.

ENVELOPE

Roofs **Rating: 3**

The original portion of the building along with the 1980 addition, have built-up asphalt roofs. These areas were re-roofed in 1996. Both roof drains and through-wall scuppers are provided. Metal perimeter flashing was bent up to accommodate the re-roofing. In most cases it was not bent back down sufficiently to prevent water from getting under the flashing. In addition the presence of the flashing prevents visual inspection of the roof-to-wall intersection. When this portion was re-roofed, the roofing was installed so as to drain away from rather than towards the scuppers. The aggregate surfacing has shifted in some places exposing the asphalt flood coat and membrane. Staff reported several recent roof leaks that appear to have been repaired. There is a large crack in one of the repaired areas.

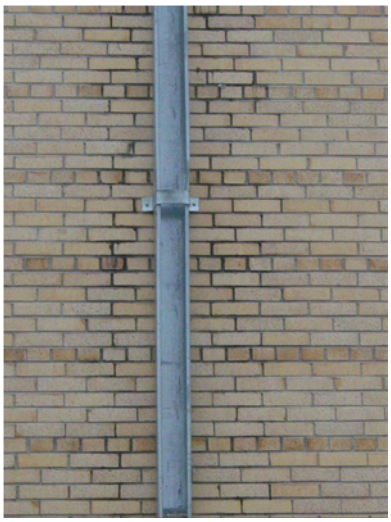
The concrete sun-shades on the west side of the building also have a built-up asphalt roof system. The edge of the concrete shows signs of spalling in several places, indicating water infiltration beneath the roof membrane. Also, the aggregate is missing from significant areas, exposing the roof system to UV rays. In addition, the mineral-surfaced cap flashing is cracking in many places.

The 1990 episode has a ballasted EPDM roof system, which was replaced in 2006. No problems were observed or reported. The nature of EPDM is that it will shrink over time. With a ballasted roof system, this shrinkage will be noticeable at the roof-to-wall transition where the membrane will form a “tent” between the roof and wall. Because this “tent” is in tension, any small puncture or other hole will rapidly increase in size.


Deteriorating concrete coping.


Deterioration of window sill and caulking.


Mortar joints at sill deteriorating.


Mortar joints behind downspout deteriorating.


Log siding shrinking and splitting.

The parapet around the entire building is capped with a precast concrete coping. The coping on the original portion of the building is spalling and pitting. In addition head joints have deteriorated or are deteriorating and should be replaced. Directly above the main entrance, one section of coping has shifted such that it sticks out past the wall 1" - 2".

Walls (Skin) **Rating: 6**

The walls are mostly face brick veneer, with some areas of painted concrete.

The brick is in satisfactory condition, however mortar joints are deteriorating at some window sills, and behind downspouts on the north side of the original portion and the 1990 infill portion. In addition there are several small holes in the mortar on the north side of the east wing, 1990 episode. The lintel supporting the brick above the window on the west end of the 1990 Activity Room does not extend the full width of the opening.


Lintel does not extend full width of opening.


Paint damaged by lawn care equipment.

The paint is spalling off of the concrete in several places. In addition the paint is being scraped off the walls at the bottom by lawn care equipment. One small area adjacent to the main entrance was not re-painted when a sign was removed. On the west side of the east wing, 1990 addition, the painted wall is badly soiled from an exhaust vent.

The Gazebo has split-log type wood siding. Some boards are shrinking creating gaps between boards. Some boards are also splitting at the fasteners.

The painted finish on window-well covers is deteriorating, and the screens are bent.

Windows **Rating: 3**

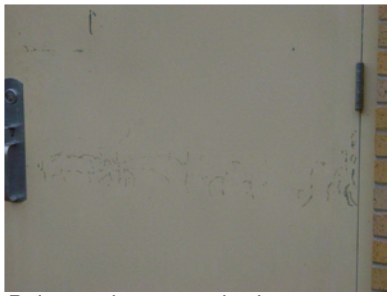
The original portion of the facility has painted, single-hung, single-glazed wood windows with storm windows in most areas, with aluminum fixed and casement windows with insulating glass at the SE and SW ends of the building and

Failure of caulking at aluminum window adjacent to entrance.

Duct tape used to repair window.

In-filled window; note paint deterioration.

Lack of weatherstripping between door leafs.



Paint on door scratched.

adjacent to the main entrance. These aluminum windows are not original to the building as the plans indicate steel sash windows. The caulking around the perimeter of the aluminum windows adjacent to the entry has failed. Only the windows in the 1980 episode provide satisfactory thermal insulation.

The interior finish of the wood windows is in satisfactory condition for the most part, however the painted finish on the exterior has deteriorated, especially at sills, allowing the wood to check and split. Duct tape was used to make repairs to a window on the west side of the Resident Dining Room. One pane of glass in the Resident Dining Room is broken. Windows on the Ground Floor (lowest level) are difficult to open for some residents and staff due to the height of the sash above the floor. No problems were observed with the aluminum windows at the north and south ends of the original portion.

The 1980 and 1990 episodes have metal-clad wood fixed and casement windows. The windows in the 1980 addition have insulating glass, while those in the 1990 episode have double panes of single glazing. One pane of insulating glass on the east end of the third floor of the 1980 episode was fogged, indicating that the insulating seal has been broken. Several windows have been modified to accommodate air conditioning units.

Several windows have been filled in with painted wood. The paint is deteriorating in most of these cases.

The caulking around the perimeter of the windows in the original portion of the building has deteriorated. Caulking around windows in the later episodes is beginning to deteriorate, especially on the east and south sides.

Exterior Doors **Rating: 4**

The main entrance doors are aluminum with single glazing. The weatherstripping around and between the door leafs does not provide an adequate seal. Light is visible between the door leafs. The sidelites have single glazing in wood frames. The finish on the wood, both interior and exterior, is deteriorating. Other exterior doors in the original portion of the building are painted hollow metal in painted steel frames, with wired glass and old hardware and weatherstripping.

There are no exterior doors in the 1980 addition.

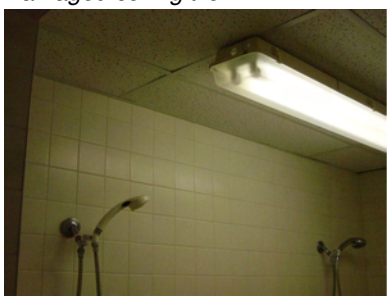
Exterior doors at the 1990 episode are painted hollow metal in painted steel frames. The paint on the door from the SE corner of the Activity Room is scratched and deteriorating. At the pair of doors on the north side of the Mechanical Room, north of

Lack of weatherstripping between door leafs.

Door to Mechanical Room rusted.

Stained ceiling above serving line.

Damaged ceiling tile.



Non-water-resistant tile in shower.

the 1980 addition, there is no weatherstripping between the doors, and the bottom of the doors is rusted.

The doors in the Gazebo are metal-clad wood French Doors. No locking hardware is provided on these doors, only a door position alarm. See also "Codes - Life Safety/Building Codes: Means of Egress".

Soffits and Fascias **Rating: 8**

The only soffits are at the porch at the main entrance and the underside of the concrete sun shades. These soffits are painted and no significant problems were observed.

There are no fascias on the building.

INTERIORS

Ceilings **Rating: 4**

Most of the building has a suspended acoustical ceiling system. Ceilings in mechanical spaces and other secondary rooms are painted concrete. The ceiling in the Gazebo is wood.

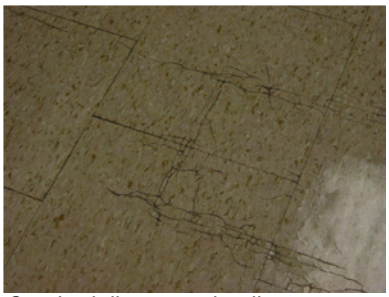
There are many places throughout the facility where the ceiling tiles have or are beginning to warp, as evidenced by corners raising up from the grid, or sag. The ceiling, including the suspension system, above the serving line in the Resident Dining Room and in the Smoking Lounges is badly stained. Tiles adjacent to a couple of supply air registers are dirty. Tiles and suspension systems in shower areas in the original portion of the building do not appear to be moisture-resistant type. There are water stains on only a few tiles. And tiles in several areas are scratched and otherwise slightly damaged. Tiles in several places have been cut or otherwise modified to accommodate new wiring etc.

Painted ceilings are showing typical signs of normal wear and tear.

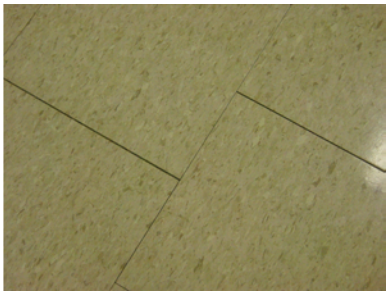
The ceiling in the Gazebo appears to be in satisfactory condition. See also "Codes: Life Safety/Building Codes - Construction Type".

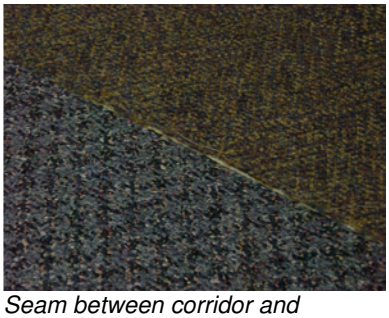
Flooring **Rating: 6**

Floors in corridors, resident rooms in the original portion and the 1980 addition, dining rooms, activity rooms, smoking lounges, TV rooms, stairs etc. are vinyl composition tile. Several tile behind the serving line in the Resident Dining Room are cracked. In addition, several tile adjacent to the elevator in the 1980 addition are cracked. Floor tile in the


Cracked tile at serving line.


Water stain under electric water cooler.


Excessive joints in corridor.


Seam between corridor and resident room carpet.

Smoking Lounge in the 1980 addition are badly stained from cigarette smoke. Tiles in the Activity/Dining Room in the 1990 episode are slightly scuffed. In the Employee Dining Room in the original portion chairs have small rags attached to their feet apparently to prevent damage to the floor. A couple of tile towards the north end of the east wing, 1990 episode, are damaged, and there is a water stain on the floor beneath the electric water cooler at the east end of the corridor on the second floor of the original portion. The joints between floor tile in the corridor outside the Resident Dining Room are larger than normal. Some asbestos floor tile, which also have asbestos-containing mastic, still remain.

Resident rooms and first floor corridors in the 1990 addition, the first floor corridor in the 1980 episode, the Lobby, most offices, the Mail Room, the two small Chapels, the Multi-Purpose Room, the Lounge at the east end of the third floor in the original portion, the Library and Lounge on the second floor in the original portion, and the Gazebo all have carpet. Some areas have apparently been re-carpeted recently as they show no signs of wear and tear. The carpet in several offices is showing signs of aging including wear marks and seams becoming evident. There are stains on the carpet in a couple of the lounges, and the carpet in some resident rooms in the 1990 addition is slightly soiled. Seams between the resident room carpet and the corridor carpet in the 1990 episode are coming apart in a few places.

Floors in the resident laundry rooms, toilet rooms, employee locker rooms, Hydrotherapy Room, in the original portion, and in resident shower rooms and toilet rooms in the 1980 episode are ceramic tile. Other than soiled grout joints, no problems were observed.

Floors in resident toilet rooms and soiled linen rooms in the 1990 episode are vinyl sheet flooring. No problems were observed.

The floor in the Kitchen and Dishwashing area is quarry tile. Other than soiled grout joints, no problems were observed, although staff did report one hairline crack that could not be found at the time of the observation.

Where vinyl tile and carpet exists there is rubber wall base. The base is damaged in several places in the original portion of the building, and scuffed and scratched from carts, walkers etc. in other parts of the building.

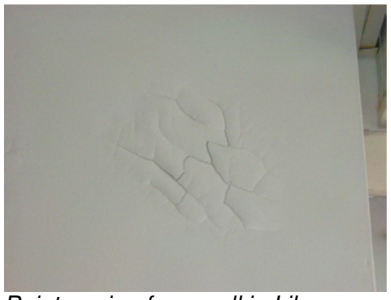
Painted concrete floors in mechanical rooms etc. are exhibiting typical signs of normal wear and tear.

Damaged wall base in original portion of building.

Wall corner damage.

Water damage beneath lavatory.

Ceramic tile missing at window jamb.



Paint peeing from wall in Library.

Wall Finishes **Rating: 7**

The majority of walls are painted, with concrete, concrete masonry, plaster or a gypsum board substrate. Some areas have vinyl wall coverings and/or borders. The walls in the Gazebo have stained wood paneling (see also "Codes: Life Safety/Building Codes - Construction Type"). Walls are cracked in several locations, there is slight damage at some corners where carts, wheelchairs or walkers have chipped the substrate, and the paint finish shows signs of normal wear and tear such as pin holes, chips and small areas where tape has peeled away the paint. A small area beneath a resident room lavatory has water damage. It appears that the damage was caused by a leak as the escutcheon for the hot water pipe does not cover the hole in the wall (hole made to repair the pipe). There is also water damage to the wall below an electric water cooler at the south end of the second floor in the original portion. In the resident room at the NE corner of the second floor of the original portion, and at the south side of the Library on the same floor, the paint is peeling off of the walls due to water infiltration. At the resident room the paint is peeling directly behind a downspout, behind which the mortar joints appear to be deteriorating due to water infiltration. Inside the Mail Room, the wall below the mail boxes appears to have been re-finished or repaired. Some areas have not been completely re-painted.

Walls in toilet rooms, showers and the Kitchen are ceramic tile. In the Men's Toilet Room on the north end of the second floor in the original portion, the tile has fallen off the window jamb.

Window sills in the original portion of the building are stone. A few have small cracks. Sills in the 1990 addition are plastic laminate. Gaps have formed between adjoining sections.

Interior Openings **Rating: 7**

Doors to resident rooms and public spaces are wood doors with a clear finish in painted hollow metal frames. Doors to mechanical rooms, stairs, cross-corridor doors etc. are painted hollow metal in painted hollow metal frames. All doors and frames are showing signs of normal wear and tear including scratches, dents and other minor surface problems. The closer on the door to the stairway on the ground floor (lowest level) of the 1980 episode leaked hydraulic fluid staining the door. Some hardware in the original portion and the 1980 addition has been replaced during remodeling or as required, however there are still numerous closers that are not commercial grade. In addition, panic devices are old, standard tubular bar type


Closer leaked fluid staining door.

which give an "institutional" appearance. Some closers shut doors too hard and should be adjusted or replaced.

There is a customer service window at the reception desk in the Lobby that consists of a pane of glass with a transaction-slot and voice hole.

There is a Cookson manual rolling counter door at the dish return in the Resident Dining Room that is in satisfactory condition.

There is a wood folding door in the Multi-Purpose Room in the 1990 addition. There is minor damage to some of the wood panels.

The borrowed lites at the Waiting Area adjacent to the Activity Room have a single glass pane in wood frames. No problems were observed.

See also , "Codes - Life Safety/Building Codes - Means of Egress", "Codes - Life Safety/Building Codes: Area/Occupancy Separations" and "Codes - Handicapped Accessibility: Rooms/Spaces".

Stairs/Ramps **Rating: 8**

There are four public stairways in the original portion of the building, one in the 1980 addition, and one in the 1990 episode. All have vinyl tile treads (vinyl asbestos tile in 1980 addition according to drawings) with vinyl risers and steel nosings. Handrails are painted steel, aluminum or stainless steel. The paint on handrails is deteriorating.

The stairway in the mechanical room on the ground floor of the original portion is a painted steel stair. The paint finish has deteriorated.

The stairway from the second floor of the 1980 addition to the roof also has vinyl asbestos tile and painted steel handrails. No problems were observed.

See also "Codes - Life Safety/Building Codes: Means of Egress" and "Codes - Handicapped Accessibility: Building Routes".


Electric motor for traction elevator.

Elevators/Lifts **Rating: 4**

There are three elevators in the facility. The elevator in the original portion is an Otis, electric traction type, with a capacity of 4,000 pounds. It has vinyl composition tile flooring, baked enamel on steel wall panels, and a stainless steel handrail. The floor tile is scuffed. The elevator in the 1980 addition is also an electric traction type with a 4,000 pound capacity. It has carpeting, wood-grain plastic laminate wall


Narrow staff lockers.


Dishwashing machine.


Panel loose at serving line.


Deteriorating finish on toilet partition.


Deteriorating cabinets in original portion of building.

panels, and a stainless steel handrail. The finishes appeared to be in satisfactory condition. The elevator in the 1990 episode is a Dover hydraulic elevator with a 2,500 pound capacity. It has carpeting, wood-grain plastic laminate wall panels, and a stainless steel handrail. Controls and signals at all elevators appeared to be in satisfactory operating condition, although they are dated and showing signs of age.

Staff reported that the motors and generators for the electric traction elevators should be replaced as they are obsolete and repairs are problematic because replacement parts are difficult to find.

See also "Codes - Handicapped Accessibility: Building Routes".

Specialties **Rating: 7**

The lockers in the staff locker rooms in the original portion of the building are very narrow making storage of winter coats difficult, and there is minor damage to the doors and painted finish.

Mailboxes in the original portion of the building are in satisfactory condition, however they no longer conform to USPS requirements.

Shelving in the libraries, TV rooms etc. is showing signs of aging.

There is an operable partition in the Multi-Purpose Room of the 1990 addition. No problems were observed.

Food Service / Laundry **Rating: 8**

Staff reported that the dishwasher breaks down frequently. Other kitchen equipment was reported to be in satisfactory operating condition. One panel on the front of the serving counter in the Resident Dining Room has come loose.

No problems were reported with the laundry equipment.

Toilet & Bath Accessories **Rating: 5**

Toilet partitions are steel with a baked enamel finish. Partitions are dented and the finish is deteriorating in many places.

See also "Codes - Handicapped Accessibility: Toilet Rooms".

Miscellaneous **Rating: 4**

Most cabinets in the original portion of the building are showing signs of aging, although some have recently been re-finished. "Codes - Handicapped Accessibility: Rooms/Spaces".

Gate at main entrance.

Doors to Activity Room in 1990 episode. Note direction of swing and exit sign.

Exit from Gazebo. Note deck in background.

Gate obstructing means of egress at stairs adjacent to Activity Room.

Exit door blocked off. Note motorized wheelchairs adjacent to exit.

Furniture in lounges, TV rooms etc., especially the smoking rooms, is showing signs of aging. Upholstery is fading and/or stained, wood finishes are deteriorating, and there are scratches and dents.

CODES - LIFE SAFETY

The following analysis is based on the requirements for an existing Health Care and Residential Board and Care occupancies as stipulated in NFPA 101 Life Safety Code (LSC), 2003 edition. Applicable requirements of the International Building Code (IBC), 2003 edition, North Dakota State Building Code, and North Dakota Health Department requirements are noted where they would be necessary as part of any significant remodeling project.

Means of Egress **Rating: 4**

The stair in the center of the original portion of the building cannot be used as a means of egress since it discharges into the Lobby which has a lesser fire-resistive construction rating than the stair, and the landings are not long enough. (It does not need to be a means of egress.) In addition, just outside the main entrance there is a gate at the top of the stairs that does not swing in the direction of egress travel.

The corridor on the ground floor between the original portion and the 1980 addition forms a dead-end traveling in both directions. The dead end is created by doors not swinging in the direction of egress travel. The corridor on the ground floor of the 1990 addition, adjacent to the elevator, forms a dead-end. These would be classified as dead-ends only under IBC provisions that would take effect if significant remodeling is undertaken in these areas.

One means of egress from the upper floor of the 1990 episode passes through the Activity Room. This is not permitted since the Activity Room is not constructed as a corridor and does note qualify as an intervening room.

The door at the north exit from the Gazebo swings in the wrong direction. And the south exit leads to a deck which wraps around the Gazebo to the south and west, directly adjacent to the building.

A gate at the first floor landing for the stairs on the east side of the Activity Room in the original portion of the building swings in the wrong direction and is equipped with non-compliant latching hardware. The gate should be removed.

Several stairway doors were taped off with "Do Not Enter" signs to prevent some residents from leaving the facility. These signs would confuse guests etc. It is recommended that another solution be found for this problem.

Motorized wheelchairs are parked at the north end of the ground floor corridor in the 1990 episode somewhat restricting access to the exit door.

Handrails at stairs in the original portion and the 1980 episode lack the required extensions at landings.

Smoke/Fire Detection & Alarm Systems **Rating: 6**

In the original portion of the building, there are no smoke detectors in the Activity Room, the toilet rooms, Lobby or offices. Staff reported that the fire alarm system was installed throughout the building in 1990 and updated in 2000. It is a Pyrotechnics brand, with a MXL Series Control panel, analog detection loops, discrete output circuits, and separate output circuits for chimes, horns and visual appliances. The wiring in the original portion and the 1980 addition was re-used when the system was upgraded. This wiring should be replaced. See also "Codes: Handicapped Accessibility - Signage/Signals".

Fire Suppression **Rating: 5**

The entire facility is equipped with an automatic fire sprinkler system which was updated in 2000, however there is some question as to the type(s) of sprinkler heads installed. The Health Dept. has cited the facility for failure to maintain and test sprinklers in accordance with its requirements.

Louver on corridor door.

Area/Occupancy Separations **Rating: 2**

Many corridor doors and stairway doors in the original portion of the building have no fire rating label, no closer, no intumescent gasketing and no smoke seal. In addition some doors have no latch, and others have louvers.

The service window at the reception desk is not a protected opening. Windows on west side of the 1980 addition are not protected (wall is 3-hour rated).

The exhaust air shaft between resident storage units and the corridor walls in the original portion of the building is not a fire-rated enclosure, and there are no dampers at each floor level.

Cross-corridor doors on the ground floor between the 1980 and 1990 episodes have a non-compliant smoke seal, as does a door between the 1980 episode and the original portion on that floor.

No opening protection at reception desk.

There is no door between the corridor and the resident Dining Room, 1990 episode.

Doors to the Receiving Room in the 1990 episode have non-compliant smoke seals.

Storage areas below stairways do not have fire-resistive rated doors.

There is no smoke/fire damper in the exhaust duct from the hood behind the serving line in the Resident Dining Room. Staff also believes that there are un-sealed penetrations in the fire wall between the Kitchen and the Dining Room, and between the Activity Room (original portion) and adjacent rooms in the 1990 addition.

There are un-sealed floor penetrations in the stairways of the original portion of the facility. There are also items in the stairwells such as piping which are not allowed in the stairs.

Any modifications made to the Activity Room in the 1990 addition, or adjacent corridor, will require replacement of the borrowed lites adjacent to the door to the Activity Room since it is not a protected opening.

According to the latest Health Department survey, stairway enclosures and return air shafts in the original portion of the facility do not meet the required fire-resistive or smoke containment standards. These findings were corroborated by this investigation; see comments in this section.

Lighting Systems **Rating: 9**

Exit lights appear to be located in accordance with Code requirements.

Emergency lighting is provided by fluorescent fixtures connected to the generator.

Safety Features **Rating: 7**

Guardrails at stairs in the 1980 episode do not conform to current IBC height requirements.

Construction Type **Rating: 7**

The wood paneling on the walls and ceilings in the Gazebo is permitted by Code in an existing facility, but would not be allowed in a new facility because it does not meet flame spread or smoke development limits.

Parking space striping fading.

Lack of handrail extensions at ramp.

CODES - HANDICAPPED ACCESS

Parking/Drop Off **Rating: 5**

There is no compliant van-accessible parking space. In addition the location of the accessible parking spaces forces persons to cross the driveway to get to the building.

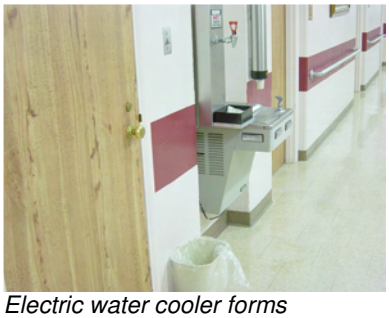
There is no passenger loading zone.

The access aisle adjacent to accessible parking spaces is not striped to discourage people from parking in it. In addition, the striping is beginning to fade.

Site Routes **Rating: 5**

The upper run of the ramp adjacent to the main entrance exceeds the maximum allowable slope, and it exceeds the maximum allowable rise of 30 inches. In addition, the handrails do not extend as required at the bottom of the ramp runs.

There is no sign identifying the accessible entrance.



Electric water cooler forms obstacle.

Wall-mounted fan forms obstacle.

Bric-a-brac shelve form obstacle.

Entrances and Exits **Rating: 6**

There are an insufficient number of accessible exits.

Building Routes **Rating: 4**

Areas of refuge at stairs are not required because the building is fully sprinklered.

Maneuvering clearances are not provided at many doors.

Electric water coolers, wall-mounted oscillating fans and bric-a-brac shelves (1990) form obstacles to visually-impaired persons by protruding into the accessible route.

The reception counter at the Lobby is not accessible.

At the elevator in the 1980 addition, the floor designation is provided on only one side of the hoistway entrance, and it is a non-compliant sign (no Braille). In addition there are no tactile symbols or characters at the access to the emergency phone in the elevator in both the original portion and the 1980 episode.

Rooms/Spaces **Rating: 3**

Many doors still have knobs and a few, including doors at stairs in the original portion of the facility, have thumbpiece latchsets.

Storage facilities within resident rooms are not accessible. Clothes rods in the 1980 episode are 70 inches above the floor.

Non-compliant hoistway sign.


Thumbpiece latch on door.


Resident storage unit in original portion.

Doors to resident storage units in the 1990 episode have recessed pulls.

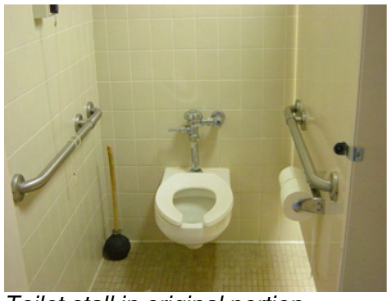
Resident laundry equipment is not accessible (too high).

Toilet Rooms **Rating: 1**

There are no fully wheelchair accessible public or multiple-user toilet rooms in the facility. Some toilet compartments at multiple-user toilet rooms comply only with the requirements for ambulatory toilet stalls. Lavatories in the original portion of the building have grab bars installed in front and along the sides, presumably to help people stand at the lavatory, but they restrict the reach to faucets somewhat. Shower spray units are and lavatory faucets are non-compliant.

Resident toilet rooms in the original portion of the building are totally inaccessible, as are the resident toilet rooms in the NE corner of the 1980 addition. Other resident toilet rooms in the 1980 episode do not provide the required clearance at the water closet and there is no grab bar behind the water closet. The resident toilet rooms in the 1990 addition appear to conform to ADA requirements.

Drainage and water supply piping at lavatories is not insulated and protected as required.


Toilet stall in original portion.


Resident toilet room in 1978 addition; note lack of rear grab bar.

Signage/ Signals **Rating: 3**

Non-compliant room and door sign.

In the original portion of the building and the 1980 addition, room signs are non-compliant. Directional signs throughout the facility are non-compliant.

There are no strobe-type fire alarm horns in many group spaces in the original portion of the building including toilet rooms, TV rooms, the libraries, the Museum, the Activity Room, and the smoking room. There are no strobe-type horns in the smoking room of the 1978 addition, or in the Physical Therapy Room in the 1990 episode.

Alarm bell in Activity Room in original portion.

CODES - HEALTH DEPT.

There is no accessible toilet or dressing room adjacent to the Hydrotherapy Room.

There are an insufficient number of water closets on the third floor of the original portion.

Some single rooms have a dimension of less than 10 feet.

MECHANICAL

Plumbing System **Rating: 3**
(including gases and compressed gases)

Except where it has been replaced, domestic water piping in the original portion of the facility is galvanized steel. Because of its age it is in poor condition and should be replaced. The remainder of the domestic water piping is copper and is in satisfactory condition.

There are very few piping isolation valves in the facility. When repairs need to be made to the domestic water piping, a good deal of the facility must go without water.

Efflorescence on pump.

Recirculating pumps for the domestic hot water system were replaced in 1990, however one pump in the Laundry is in poor condition and should be replaced. And one pump in the ground floor mechanical room in the original portion of the facility has significant efflorescence from apparent water leaks.

Sanitary sewer piping in the original portion is cast iron and is in need of replacement. When waste piping from the Kitchen clogs, sewage backs up into the chiller mechanical room. A sewage ejector pump was installed in the basement of the original portion as part of the 1980 addition.

There is a Chemtron medical gas (oxygen) and vacuum system in the 1990 addition. The oxygen supply system has been de-activated because it required extensive maintenance and was expensive to operate. Portable oxygen generating equipment is used as required. The vacuum pumps and connections appear to be in satisfactory condition.

Lavatory in original portion of building. Note faucets.

Plumbing Fixtures **Rating: 4**

Plumbing fixtures, faucets and trim in the original portion of the facility have exceeded their useful life and should be replaced. Those fixtures, as well as those in the 1980 addition do not conform to current, recommended water-usage limits. Fixtures in the 1990 episode are in satisfactory condition. See also “Codes - Handicapped Accessibility: Toilet Rooms”.

Central Sources **Rating: 2**

The campus has five (5) boilers, three in the Power House and two in the Laundry.

Boilers #1 and #2.

Two of the Power House boilers (#1 and #2) are 1956 Cleaver Brooks fuel oil boilers used for additional heating capacity during cold weather and as standby units, while the third (#3) is a CAM'S Industry electric boiler, installed in 1981. This boiler operates continually and is taken off-line only for maintenance and repair. The fuel oil boilers require a good deal of maintenance to remove by-products of combustion. In addition, while all three boilers appear to be in relatively good operating condition, the fuel oil boilers have exceeded their expected useful life-span, and the electric boiler is approaching its expected useful life-span.

One boiler (#4) in the Laundry is a 1980 Cleaver Brooks, fuel oil boiler, while the other (#5) is a CAM'S Industry electric boiler. Both were installed in the 1981 episode. The electric boiler operates continually and presently only serves the laundry equipment. The fuel oil boiler is used as a standby for the electric boiler. These boilers have also reached their expected useful life-span.

While these boilers are in fairly good condition for their age, and repairs to all the boilers can continue to be made to keep them operational, the repairs will become more difficult and more expensive as time goes by. Metal parts begin to exhibit fatigue due to frequent heating and cooling. This fatigue is evidenced by cracks. In addition, replacement parts will become more difficult to obtain.

Deteriorating finish on fuel storage tanks.

No. 2 fuel oil is stored in three above-ground, painted steel tanks adjacent to the old power house. One tank has copper tubing wound around it through which steam is piped to heat the fuel oil and prevent it from gelling. The piping is insulated and covered with black polyethylene. Because of the limited amount of fuel oil used annually (16,000 gallons on average), it would be cost efficient to use No. 1 fuel oil, or a winter blend, and remove the steam heating system. Also, the paint is deteriorating at the top of all three tanks. Spill protection is provided by an earthen dike.

Trane chiller.

A water-cooled Trane Series R chiller was installed in the late 1990's. It is in satisfactory operating condition, and operates at approximately 70 percent of capacity at peak load.

There are two steam to hot water converters. One is used to provide hot water for the fan coil units in the original portion and the 1980 episode. The other is used to provide hot water/glycol mixture to the heating coils in the air handling

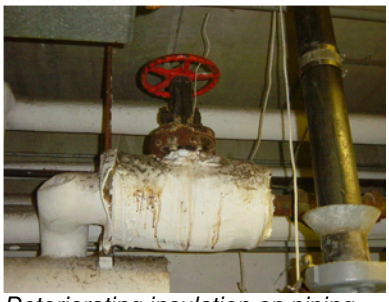
units. Heating efficiency is reduced slightly by converting steam to hot water. The unit that provides hot water to fan coil units etc. is located in the penthouse on the 1980 episode. The controls on this unit are in poor condition, the outside anticipator does not work for either the hot water pumps or the hot water reset schedule. The steam trap for the drip leg on the converter was blowing by steam. The converter controls should be upgraded to DDC and connected to the BMS.

Water heater; note lack of insulation on piping.

Two Aerco water heaters produce hot water for the facility by converting steam. One is used for domestic hot water and the other is dedicated for the Laundry. They are 26 years old and in satisfactory condition and can be expected to last up to 35 years. If the steam pressure reducing station on the Laundry boiler were upgraded and connected to the two water heaters, the laundry boilers could then provide steam for all domestic hot water. This would allow the Power House boilers and steam distribution system to be taken off-line when heating is not required. This would reduce fuel costs, and heat loss in steam distribution lines and equipment rooms (heat gain in adjacent rooms), as well as boiler heat losses during the summer.

There are hot water unit heaters in several ancillary spaces. The units are thermostatically controlled. No problems were observed or reported.

Distribution System **Rating: 2**



Deteriorating insulation on piping.

Steam distribution is provided by black iron piping. There is a 6 PSI steam header originating in the Power House that is used continually for the production of hot water, and in the winter months for heating the facility. Much of this piping is under-insulated or has no insulation resulting in significant heat losses and additional energy costs. There is an 8-inch steam line connecting the old power house to the campus distribution system that is approx. 180 feet long and operates at a nominal 6 PSI. This line is used to heat the old boiler room in the winter, and because of heat losses and other inefficiencies, it should be decommissioned, and a new fuel-oil furnace installed to heat the old boiler room.

There are very few isolation valves on the piping runs, making repairs difficult. In addition many of the valves are in poor condition due to their age. Steam valves are in need of new gaskets and seals.

There are two circulating pumps for the both the hot water and chilled water systems. The pumps are operated alternately, which has helped keep them in good operating condition.


Condensate pumps at boiler #4.

Because of the age of the piping, problems will most likely become more frequent and more difficult to repair (concealed within construction).

Condensate piping, except that to the 1980 addition, was installed in 1990. Condensate and steam piping from the Power House to the building is nearly 60 years old and should be replaced. Condensate pumps for boiler #4 are in poor condition.

Air Handlers

Ratings are provided for each air handler individually at the end of the comments.

AHU #1 serves the 1990 addition. It uses 100 percent outside air and works in parallel with exhaust fan #9. The AHU provides a constant volume of air at a constant discharge temperature. The unit has a heating coil which is fed with the hot water/glycol mixture. A chilled water coil was added to this unit. There is a 3-way valve which controls the discharge air temperature. The unit has no control valve. An inline booster pump was added. There are no known sequences of operation for this unit. In addition the filter access doors were propped open causing the unit to draw the majority of its air from inside the equipment room. The unit has direct digital controls (DDC) and is connected to the existing building monitoring system (BMS). Exhaust fan #9 runs continuously, resulting in a negative air pressure in the facility. Review of the existing system indicates that 100 percent exhaust and 100 percent make-up air are not required for the areas this unit serves. Exhaust fan #9 should be decommissioned and its ductwork removed. Return air ductwork should be installed, along with a mixing box to reduce the amount of outside air intake. In addition AHU #1 should be added to a time schedule on the BMS to reduce its operation from 168 hours/week to 80 hours/week. And the DDC controls for mixed air system and cooling coil should be updated. **Rating: 5**

AHU #2 provides make-up air to the Kitchen and Dining Room. It has a hot-water heating coil and a chilled water cooling coil. It has DDC controls and is connected to the existing building automation system (BAS). This unit operates 24/7. The associated range hood (Exhaust fan #15), Serving Line exhaust (EF #16), and Dishwash exhaust (EF #10) are manually turned on in the morning and turned off when staff leaves each day. However AHU #2 is not turned off because of freeze-up problems in the range hood exhaust automatic water wash-down and fire suppression system. By leaving AHU #2 running, this creates positive pressure in the room, pushing

warm air up through the exhaust fans keeping them warm enough to prevent freeze-up. A variable frequency drive should be installed on the range hood exhaust fan and to the serving line exhaust fan so the fan speeds could be reduced to 20 percent when the Kitchen is unoccupied or the range hood is not being used. Back-draft dampers should be installed on the dishwash exhaust allowing the unit to be turned off during unoccupied times or when the dishwashing machine is not in use. A variable frequency drive should be installed on AHU #2 so that the unit could track the exhaust fans and adjust the CFM based on the amount of make-up air required. Finally, kitchen staff should be trained to turn off exhaust fans when they are not required. **Rating: 5**

AHU #3 serves the Multi-Purpose Room, Chapel, Barber/Beauty Salon, general offices and two patient rooms on the first floor of the 1980 episode. It is a mixed air unit, providing a constant volume of air at a constant discharge temperature. There are heating and cooling coils (hot water/glycol and chiller sources respectively). There is a 3-way valve that controls the discharge. The unit has DDC controls and is connected to the BMS. This unit operates 24/7 even though most spaces are occupied from 7:00 AM to 7:00 PM daily. The two resident rooms should be disconnected from this unit and connected to AHU #7. AHU #3 should be on a time schedule to operate for 14 hours per day, 7 days a week. **Rating: 7**

AHU #4 provides ventilation and air conditioning to the first floor of the 1990 episode, including the Activity/Dining Room and resident rooms. The unit utilizes some return air, however it supplies air at a uniform temperature (no individual thermostats) which results in uneven cooling in the summer. **Rating: 6.**

AHU #5 provides make-up air to the north half of the original building. It has a hot water heating coil and a chilled water cooling coil, an automatic humidifier, and it utilizes 100 percent outside air. It provides make-up air to a combination of resident rooms, general occupancy areas and offices. It has DDC controls and is connected to the existing BMS. The unit operates 24/7. Exhaust fan #1 works in conjunction with this unit and provides exhaust for the same area. The fan runs 24/7 and is not connected to the BMS. The exhaust air is drawn through shafts behind the storage units in these rooms. See also “Codes - Life Safety/Building Codes: Area/Occupancy Separations”. The entire air supply and exhaust system in this area of the facility should be replaced. **Rating: 2**

Water on AHU #6 from leaking humidifier.

AHU #6 provides make-up air to the south half of the original building. It ahs a hot water heating coil and a chilled water cooling coil, an automatic humidifier, and it utilizes 100 percent outside air. It provides make-up air to a combination of resident rooms, general occupancy areas and offices. It has DDC controls and is connected to the existing BMS. The unit operates 24/7. Exhaust fan #2 works in conjunction with this unit and provides exhaust for the same area. The fan runs 24/7 and is not connected to the BMS. The humidifier leaks onto the AHU cover and the unit is noisy. The exhaust air is drawn through shafts behind the storage units in these rooms. See also "Codes - Life Safety/Building Codes: Area/Occupancy Separations". The entire air supply and exhaust system in this area of the facility should be replaced. **Rating: 2**

AHU #7 in penthouse.

AHU #7 provides make-up air to a combination of resident rooms, general occupancy areas and offices on the ground floor. It has a steam heating coil with a face and bypass, and an independent DX cooling system. The unit uses 100 percent outside air, has no DDC controls and is not connected to the BMS. This unit is in very poor condition as a result of apparently having been fabricated from a jumble of components. The unit operates 24/7. There is an exhaust fan that works in conjunction with this unit. It runs 24/7 and is not connected to the BMS. The air conditioning unit has problems keeping up during cooling conditions. AHU #7 and the associated exhaust fan and cooling unit should be decommissioned. A plate and frame heat recovery unit with a steam coil should be installed to replace them. Zone control dampers should be installed on the ground floor to eliminate unnecessary make-up air ventilation. Variable frequency drives should be installed to reduce ventilation levels by shutting off the unit during unoccupied periods (ground floor), and reducing ventilation levels to minimum requirements in resident rooms during evening hours. The controls should be upgraded and the unit connected to the BMS, including a time schedule for control of the occupancy dampers and variable frequency drives. **Rating: 2**

AHU #8 serves the Activity Room in the original portion of the building. It is a mixed air, constant volume, single zone AHU. The unit has steam heat with DX cooling. The controls are in poor condition and the unit is not connected to the BMS. Because the room is used as a smoking room at all hours of the day, the unit runs continuously to ventilate the space. The unit generates more noise than should be expected, and staff indicated that the unit is in less than satisfactory operating condition. The controls should be upgraded and the unit should be connected to the BMS. **Rating: 5**

The Laundry has a stand-alone cooling unit that utilizes 100 percent return air. The unit has two DX cooling units rated at 5 ton each. It is controlled by a wall-mounted thermostat that only has a single setting (no set-back for unoccupied times). The thermostat should be removed and DDC controls installed. The unit should be connected to the BAS and a time schedule developed to disable the unit when the Laundry is unoccupied. **Rating: 7**

There are two exhaust fans in the Boiler Room in the 1980 addition. Their function is to cool the room when the boilers are on-line. They are controlled by a wall thermostat. The fans run continuously when the boilers are operating, but they do not have make-up air dampers or make-up air fans that operate when the fans are running. This prevents the room from being cooled with 74-degree air, and it creates negative pressure in the building resulting in increased drafts through doors and windows. There is also a set of combustion air dampers that are controlled by a second thermostat. The thermostatic controls for the exhaust fans should be replaced. A new make-up air unit should be installed, and the existing boiler combustion air dampers should be repaired. **Rating: 5**

The facility has multiple building exhaust fans. All of these fans operate 24/7. Some of these fans could be shut off during unoccupied times. None of the fans are controlled or monitored by the BAS. All fans should be connected to the BAS for monitoring of proper operation and scheduling off during unoccupied periods. **Rating: 5**

The Paint Shop has an exhaust hood vented directly to the exterior. There is no sawdust collection or evacuation system in the Wood Shop. **Rating: 2**

Air Distribution and Returns **Rating: 3**

Exhaust air is drawn through gap between upper and lower portions of storage unit.

The original portion of the facility has very little actual ductwork. Exhaust air is drawn in through spaces in storage cabinets and routed through shafts in the building construction. See also “Codes - Life Safety/Building Codes: Area/Occupancy Separations”. There is no ventilation in the gang showers/toilets. Ventilation should be added to reduce potential moisture-related problems.

There is no ventilation in the lower level Mechanical Room, resulting in dangerously hot air temperatures caused by heat from the steam operated equipment, and under-insulated steam and condensate piping. Ventilation should be added to reduce the air temperature to safer levels for personnel.

Ductwork in the 1980 and 1990 additions is galvanized metal and is in satisfactory condition, although there is no return air ductwork only supply and exhaust. See also “Mechanical - Air Handlers”.

Radiation/Convectors **Rating: 6**

The original portion of the building has through-wall fan coil units to provide heating, cooling and ventilation. They have hot water coils for heating and chilled water coils for cooling. The units do not control the temperature well because the control valves operate poorly. In addition, occupants have a difficult time setting the controls to the desired temperature. In addition many of the control valves leak and repairs are difficult due to the design of the units.

The 1980 addition has cabinet unit heaters in corridors and the stairway, and finned-tube radiation in resident rooms and other rooms with individual room controls (thermostat). There is paint on the covers of the finned-tube radiation from when walls were re-painted.

The 1990 episode has cabinet unit heaters in resident rooms and other areas. No problems were observed or reported.

Temperature Control **Rating: 4**

The facility has an older, text-based automatic temperature controls BAS system by Johnson Controls. As noted previously, not all mechanical equipment is connected to the BAS. This equipment should be connected to the BAS to improve energy efficiency. The system should be upgraded to a newer, graphical system to improve operator interface and to allow interface with newer operating software and communication systems.

Resident rooms in the 1980 episode, have wall thermostats to control the radiation units in these rooms. Cabinet unit heaters in corridors and common areas also have thermostats. The fan coil units in the resident rooms in the original portion and cabinet unit heaters in the resident rooms in the 1990 addition are operated by controls within the units, not thermostats. Thermostats are either Honeywell or Johnson Controls. No problems with the thermostats were reported or observed.

ELECTRICAL

Main Service **Rating: 8**

The building has two electrical services. One is located in the 1981 boiler room addition and is rated at 900 amps, 480-volt, 3-phase, 4 wire. This service is dedicated to boiler #5. The other service is in the 1990 episode. It is rated at 2,000 amps, 480-volt, 3-phase, 4 wire, and is a Siemens brand unit operating at 35% capacity. Both services are in satisfactory condition. Based on existing loads this service has spare capacity.

Switchboard and distribution panels.

Typical circuit breaker panel.

Distribution/Panelboards **Rating: 8**

There are 480-volt distribution feeders from the main service to motor control centers, distribution panelboards, step-down transformers, lighting and power panels.

There is a 300 KVA step-down transformer and a 1,600 amp, 208/120 volt switchboard next to the 1990 main service. The switchboard serves all 120 and 208/240 volt loads. Some new panelboards were added in the original portion of the building in the 1980 episode, and some were replaced in the 1990 episode In addition feeders for the original portion were replaced in the 1990 episode. The distribution system for the 1980 addition was connected to the new service in 1990.

Panelboards are either GE or Siemens brand.

Existing conduits have no space for additional feeders.

All equipment appeared to be in satisfactory condition.

Power Distribution System/Outlets **Rating: 5**

All branch circuit wiring in the original portion of the facility was replaced during the 1990 episode. Wiring devices are the grounding type.

There are a minimal number of receptacles in the original portion, and parts of the 1980 addition.

In addition, existing conduits have no more space for additional wiring.

Illumination **Rating: 5**

For the most part, light fixtures are fluorescent fixtures with T-12 lamps and magnetic ballasts. Many of the fixtures in the original portion of the building, and over-bed fixtures are surface-mounted. There is an on-going maintenance program to replace these fixtures with types that use high-efficiency T-8 lamps and have high-efficiency electronic ballasts.

In addition there are recessed and surface-mounted incandescent fixtures in some areas, heat lamps in the resident showers in the 1980 episode, and pole-mounted fixtures in the parking lots. These fixtures are exhibiting minor problems associated with normal wear and tear.

Communication/Data Systems **Rating: 5**

Surface-mounted speakers in the original portion of the building are deteriorating.

The telephone system is used as intra-building communication between offices etc. No problems were observed or reported.

No problems were reported with the computer network cabling.

Electric Heating **Rating: N/A**

The only electric heating that was observed are recessed wall units in the resident toilet rooms in the 1990 episode. Staff indicated that these units have been disconnected.

Older disconnects at boiler #4.

Mechanical Equipment Connections **Rating: 7**

Most motor controllers were replaced as part of the 1990 episode. Motor controllers are Siemens brand MCC (motor control center) type or stand-alone type. Disconnects for boiler #4 appear to be out-dated.

New labeling should be provided to identify the equipment served and the location of the feed point.

Other Systems (Security systems, etc.) **Rating: 4**

The 1990 episode has door alarms at most exit doors. Many of these doors were closed off with warning tape to prevent residents from activating the alarms. See also “Codes - Life Safety/Building Codes: Means of Egress”.

The building has a fire alarm system, as well as smoke and fire detection equipment. See also “Codes - Life Safety/Building Codes: Smoke/Fire Detection & Alarm Systems” and “Codes - Handicapped Accessibility: Signage/Signals”.

The nurse call system in the original portion of the building and the 1980 episode has Rauland pull stations. Pull stations and the control panel in the 1990 episode are by Dukane. Staff reported that the room numbering system needs to be revised to allow for quicker response. In addition, the system is not equipped with an “emergency” indicator capability. In multiple-user toilets in the original portion, only one toilet stall has a pull. Pulls in showers in the original portion are not within reach of the shower stall.

Kohler generator.

Onan generator.

Transfer switch at Onan generator.

Generators **Rating: 6**

The generator is a Kohler, 250 KW, 480-volt, 3-phase generator in the ground floor mechanical room on the east side of the 1990 episode. It has one output circuit for 480-volt emergency equipment loads, and one output for 120/208-volt emergency equipment loads and operates at 30% capacity. It provides power for emergency lighting, resident room and kitchen fan coil units, sewage pumps, some food service equipment, air compressors, vacuum pumps, condensate pumps, generator support loads, temperature controls, fire alarm panels, elevators, some corridor convenience receptacles, medical gas monitoring, and convenience receptacles at nurses stations. There are two transfer switches, one for the 480-volt critical branch loads, and the other for 208/120-volt life safety and critical branch loads. There is no distinction between 208-120-volt life safety circuits and 208/120-volt critical branch circuits. Staff reported that the automatic transfer switch testing circuit has burned out, requiring the generator to be tested manually. There is a double-wall, underground fuel storage tank on the east side of the building.

There is an Onan, 155 KW standby rated generator in Power House. Fuel is stored in the main fuel oil storage tanks. It has three separate distribution circuits. One serves the Power House (except electric boiler) through a 400 amp automatic transfer switch. The other two are for backup of normal power in the original portion of the building. One of these circuits is 120/240 volt single phase, the other is 240/120 volt, 3-phase. Only the 3-phase circuit is in use. It requires a manual transfer switch operation in the main building. Staff reported that the transfer switch is obsolete and replacement parts are no longer available.

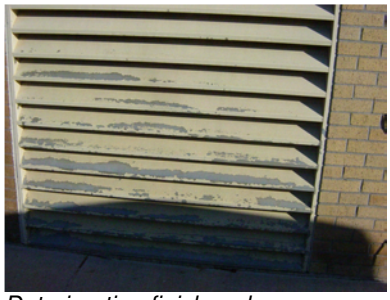
APPENDICES

ACCESSORY BUILDINGS

Angles used to secure tie rods through building.

Rusted steel window with broken glass.

Deterioration of expansion joint.



Deteriorating finish on louver.

Deteriorating finish and rusting door.

BOILER PLANT **Rating: 3**

The boiler plant has brick veneer walls with concrete block back-up and a built-up bituminous roof. The concrete slab-on-grade floor is painted, as is the interior of the concrete block up to approximately 8 feet. The roof structure is steel joists with metal decking.

Staff had to install steel angles on the east and west sides of the building with steel tie rods through the building to keep the walls from bowing outwards.

The sealant at control joints is deteriorating, as is the painted finish on the louvers. The paint on the door on the south side has deteriorated, allowing the door to rust.

One window on the east side appears to have been replaced. There are many dead bugs between the panes of glass.

The building has two separate electrical services. One is rated at 2,300 amps, 480-volt, 3-phase and is dedicated to the 1500 boiler #3. The other service is rated at 400 amps, 240/120 volt, 3-phase, and it serves boilers 1, 2 and 4, the generator power plant and other building loads. Each service is not clearly labeled as service equipment, nor do they identify the location of the other service. The branch circuit panelboards are original to the building and should be replaced. In addition, the directories at each Panelboard are out-of-date and need updating. Wiring devices are the grounding type, but are in need of replacement. Wiring is original to the building and should be upgraded. Light fixtures are fluorescent with T-12 lamps and magnetic ballasts. The fixtures should be replaced. Motor controllers have exceeded their expected useful life and should be replaced.

ORIGINAL BOILER PLANT **Rating: 2**

The original boiler plant has brick veneer walls with load-bearing clay tile back-up, and a built-up bituminous roof. The roof structure is steel joists with a concrete deck.

The building has painted steel windows with non-insulating glass. The steel is rusting in most places as the finish is virtually gone, and the glass is cracked or broken in some places.

There are significant cracks in the brick veneer, and the north wall is severely bowed outwards. The mortar joints are also deteriorating.

Cracks in brick veneer and deteriorating mortar joints.

Deteriorating finish and wood.

Three-stall garage.

Metal storage building.

Both the weatherstripping and the finish on the overhead doors are deteriorating.

The wood entrance door is deteriorating due to paint failure and age of the door.

The building has an overhead electrical service drop to a 100 amp, 120/240 volt, 3-phase, 3 wire loadcenter. Branch circuits are minimal. Light fixtures are fluorescent with T-12 lamps and magnetic ballasts. The fixtures should be replaced. New labeling should be provided for motor controllers.

3-STALL GARAGE **Rating: 8**

The 3-stall garage is a wood-framed structure SE of the main building. It has a concrete slab-on-grade, vinyl siding and asphalt shingles. It has gypsum board on the interior and is heated. No problems were reported.

METAL STORAGE BUILDING **Rating: 1**

There is a pre-engineered metal storage building SE of the 3-stall garage. It has a concrete slab-on-grade floor and painted steel windows.

The metal panels are dented, torn and otherwise damaged, with numerous repair patches. The galvanized finish is deteriorating allowing the base metal to rust.

The sliding door on the west side was removed and replaced with a coiling garage door, an adjacent walk-door and painted plywood. The paint is deteriorating. The sliding door on the east side is difficult to operate.

MECHANICAL EQUIPMENT SCHEDULE

Boilers

No.	Manufacturer	Model	Year	Fuel	Input	Output	Remarks
1	Cleaver Brooks	CB-135-150	1956	#2 fuel oil	4,455 MBTU	3,118 MBTU	Standby
2	Cleaver Brooks	CB-135-150	1956	#2 fuel oil	4,455 MBTU	3,118 MBTU	Standby
3	CAM"S Industry	24SC6	1981	electric	1,530 KW	5,220 MBTU	Primary
4	Cleaver Brooks	CB-100-70	1980	#2 fuel oil	2,929 MBTU	2,050 MBTU	Standby
5	CAM"S Industry	24SC3	1981	electric	600 KW	2,050 MBTU	Laundry

Air Handling Units

No.	CFM	Heating	Cooling	DDC	BMS	Remarks
1	1630	Hot water	Chilled water	Yes	Yes	Parallel with EF #9
2	9400	Hot water	Chilled water	Yes	Yes	Kitchen/Dining
3	2545	Hot water	Chilled water	Yes	Yes	N. end, 1980
4						
5	6310	Hot water	Chilled water	Yes	Yes	Parallel with EF #1
6	6310	Hot water	Chilled water	Yes	Yes	Parallel with EF #2
7	5065	Steam	DX	No	No	Parallel with EF
8		Steam	DX	No	No	Original Activity Rm.

Exhaust Fans

No.	Description	CFM	Current Hours of Operation per week	Proposed Hours of Operation per week
1	N. end, original	4420	168	See Report
2	S. end, original	4195	168	See Report
3	Hydrotherapy	680	168	168
4	1990 Nurse Sta.	75	168	168
5	1990 Toi. Rm.	223	168	168
6	1990 Toi. Rm.	205	168	168
7	Laundry	1300	168	60
8	1990 Act./Dining	1000	168	112
9	Ground Flr., 1990	1635	168	Remove; see report
10	Dish line	550	168	See Report
11	Ground Frl. Bath	125	168	168
12	Barber/Beauty	200	168	60
13	Toilet Rooms	125	168	168
14	Elec. Boiler exhaust	800	168	See Report
15	Range Hood exhaust	6000	168	See Report
16	Serving line exhaust	2500	168	See Report